Western University
Scholarship@Western

Department of Economics Research Reports

1971

The Estimation and Taxation of Capital Gains in Canada

Kul B. Bhatia

Follow this and additional works at: https://ir.lib.uwo.ca/economicsresrpt

Part of the Economics Commons

Citation of this paper:
RESEARCH REPORT 7132

THE ESTIMATION AND TAXATION OF
CAPITAL GAINS IN CANADA*

by

Kul B. Bhatia
Assistant Professor

November 1971

Department of Economics
The University of Western Ontario
London 72, Ontario

*I am indebted to John Bossons for substantial help, especially in deriving the empirical results presented here. Only my reluctance to burden him with half the errors has precluded his name from appearing as co-author. An earlier version of the paper was presented to the 23rd Tax Conference of the Canadian Tax Foundation in Vancouver, November, 1971.
I. INTRODUCTION

The proposed inclusion of capital gains in the income tax base is an important landmark in the annals of Canadian taxation. It is designed to bring into the tax fold reportedly large amounts of income which were going untaxed until now. Although the tax reform bill is intended mainly to improve the equity of the tax system, it will have far reaching economic effects: To mention only a few, the incidence of personal income tax on various income brackets is likely to change; investors who were previously buying and selling assets largely on the basis of price expectations will now have to consider the capital gains' tax also, especially in reshuffling their portfolio, because realized gains will be taxed. There will be deemed realization of accrued gains at death, the tax on capital gains, therefore, will also affect estate planning and related matters.

Since the report of the Carter commission, and particularly since the White Paper on tax reform, taxation of gains has been a subject of much public discussion and debate. The case, pro and con, however, has been argued, by and large, without an adequate knowledge of the facts involved. It is not known, for example, whether capital gains are a large component of income, on which assets they accrue, and people in which income and wealth categories usually receive them. In the absence of satisfactory information on these points, we cannot estimate even the likely revenue yield of the capital gains tax, much less attempt a proper analysis of the economic implications of the proposed tax change. The purpose of this paper is to present facts and figures about capital gains in Canada, and in their light, examine some behavioral implications of the proposed tax on capital gains. We face an
uphill task because although several techniques have been developed in recent economic literature to estimate capital gains and their income distribution, most of these methods cannot be applied directly to Canada: they require data on asset prices, net investment, and value of asset holdings and their income distribution for several years which are extremely scarce and of dubious quality at present in Canada.

The plan of the paper is as follows: Section II deals with alternative ways of estimating capital gains; estimates of income distribution of corporate stock, investment real estate, and capital gains for several years are presented in Section III; the paper concludes with an appraisal of these results in Section IV.

II. Facts Without Data

No direct information on realized capital gains will become available until after the 1972 income tax returns are processed. Some idea of the magnitude of realizations, however, can be formed by estimating accrued gains because the maximum amount of realization is the gains accrued to the date of realization. Since gains accruing before 1971 would be exempt from tax, the first step in estimating gains likely to be realized in 1972, therefore, is to measure gains that would accrue in 1972.

Two alternative, but equivalent, methods have been suggested in the literature for estimating accrued capital gains: (i) by using a price index directly, and (ii) by subtracting net investment from a change in the value of an asset over time. Suppose you own corporate stock worth $100 at the end of 1970, the value of your portfolio is $200 at the end of 1971, you acquire new stock worth $90 during 1971, and stock prices rise by 10 per cent during 1971, your accrued gains for 1971 will be $10. According to method 1 accrued gains \( G \) equal $100 \times .1, and under method 2, \( G = 200 - 100 - 90 \). A moment's
reflection tells us that if we do our arithmetic right, the two methods should yield identical results. A choice between them depends mainly on what data are available. The first method requires an index of asset prices and the value of initial holdings of an asset, the second uses data on value of asset holdings from time to time, and net investment. Neither of these methods, however, can be applied to Canada because of data limitations. Some information on stock prices is available from stock markets but none whatever on changes in other asset prices—e.g., prices of real estate. Similarly, sporadic data on stock holdings of large corporations are obtainable, but no systematic surveys of stock ownership, or holdings of other types of assets by various income groups have been conducted. This creates a very difficult situation because economists have yet to find a satisfactory way of generating facts without data. We make a small beginning in this paper to fill the data-gap by estimating the income distribution of corporate stock and investment real estate in Canada for some years. The state of existing data in this area, however, calls for a major effort to compile new facts and figures on asset prices, net investment and wealth-holdings—a job which, for reasons of efficiency and expediency, is best left to the Dominion Bureau of Statistics or other government agencies.

**The Dividend Approach**

In some studies in Canada, gains accruing on corporate stock have been estimated from cash dividends distributed by Canadian corporations. Dividends

---

1For a fuller description of these and other methods, see my "Accrued Capital Gains, Personal Income and Saving in the United States, 1948-64," The Review of Income and Wealth, December 1970, 363-78.

reported on individual income tax returns are first blown up to adjust for possible under-reporting. For each income class, cash dividends are allocated among different types of companies (e.g. private, widely-held etc.), ratios of accrued gains to cash dividends, estimated from a sample of companies, are then applied to these allocations to derive gains accruing to each income class.  

This approach can provide alternative estimates of gains accruing on corporate stock, but it requires intricate computations, and is based on several adjustments which might have to be made arbitrarily: for example, the adjustment for under-reporting of dividends, the estimation of accrued gains for non-dividend paying companies, etc. A comprehensive sample, representative of all types of companies, is needed from time to time to make these adjustments satisfactorily. Since a periodic sample of this nature is not available, the other methods described above are likely to yield more consistent time-series estimates of accrued gains. We shall, therefore, use those methods in our computations, but the results will be compared with those of the "dividend approach".

Capital gains have been taxed in the United States for a long time. Data on asset holdings have also been compiled in flow-of-funds accounts and studies of balance sheet of the household sector. Moreover, a few years ago, the Board of Governors of the Federal Reserve System conducted a survey of financial characteristics of consumers in which a lot of useful information on income,

---

3Cf. Bossons, Analysis of the Federal Tax Reform Proposals, Ch. 6.

4The results derived from this method so far have not included any estimates of gains accruing on foreign holdings of Canadians, but this can be corrected by including some foreign companies in the sample, or by estimating a separate ratio of accrued gains to dividends for them.
asset holdings etc. of individuals was collected.\footnote{D.S. Projector and G.S. Weiss, \textit{Survey of Financial Characteristics of Consumers}, Washington: Board of Governors of the Federal Reserve System, 1966.} If we make the assumption that the relationship between wealth and income observed in the United States applies, \textit{mutatis mutandis}, to Canada also, we can make some rough estimates of the wealth of Canadians using income figures reported on Canadian income tax returns. For example, in case of corporate stock, this assumption would imply that the ratio of value to dividends observed in the United States would apply in Canada also. Actually, this may be quite a reasonable assumption because capital markets in the two countries are interdependent many Canadians own stock in U.S. corporations, just as many U.S. citizens hold shares in Canadian companies; so, value-dividend ratios in the United States would reflect dividends paid by some Canadian corporations.

Even when this assumption is made, however, the entire problem of estimating capital gains is not solved; we shall have estimates of wealth by income bracket, but data on asset prices or net investment would still be needed. As noted above, such data are not available for Canada, so we are forced to fall back on the U.S. experience even further. Specifically, we make the following assumptions:

(i) The relationship between value of corporate stock and dividends observed in the United States applies to Canada also.

(ii) Corporate stock, and nonfarm real estate, which have accounted for most of the capital gains in the United States are major sources of capital gains in Canada also.

(iii) The rate of accrual of capital gains in the United States, averaged over a number of years, applies to Canada also.

(iv) Since our goal is to derive estimates of realized gains, we assume that the relationship between accruals and realization observed in the United States will, in general, apply to Canada also.
For the results presented in the next Section, we have used whatever evidence could be obtained from Canadian sources, to check the plausibility of these assumptions, and even modify some of them. We are aware, however, that these are strong assumptions, some of which might have to be altered or replaced when additional Canadian data are compiled.

III. Empirical Results

In this section we present estimates of accrued and realized gains on corporate stock and nonfarm real estate - two asset-types which, in our opinion, are the major sources of capital gains in Canada.

Accrued Gains on Corporate Stock

Market Value

Estimates of market value of Canadian owned corporate stock for the years 1966-68 are presented in Table I. These figures have been derived by applying value-dividend ratios computed from U.S. data to dividends reported on Canadian individual income tax returns.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 25</td>
<td>22.99</td>
<td>3.10</td>
<td>23.52</td>
<td>2.96</td>
<td>24.63</td>
<td>3.25</td>
<td>23.71</td>
<td>3.10</td>
</tr>
<tr>
<td>25 - 50</td>
<td>8.54</td>
<td>1.45</td>
<td>12.93</td>
<td>1.38</td>
<td>10.03</td>
<td>1.63</td>
<td>10.50</td>
<td>1.49</td>
</tr>
<tr>
<td>50 - 100</td>
<td>5.77</td>
<td>1.15</td>
<td>6.33</td>
<td>1.10</td>
<td>6.78</td>
<td>1.29</td>
<td>6.29</td>
<td>1.18</td>
</tr>
<tr>
<td>100 and above</td>
<td>5.39</td>
<td>1.13</td>
<td>5.91</td>
<td>0.96</td>
<td>6.04</td>
<td>1.21</td>
<td>5.78</td>
<td>1.10</td>
</tr>
<tr>
<td>Total</td>
<td>42.69</td>
<td>6.83</td>
<td>48.69</td>
<td>6.40</td>
<td>47.48</td>
<td>7.38</td>
<td>46.28</td>
<td>6.87</td>
</tr>
</tbody>
</table>

\(^a\)The letters C and F represent Canadian and foreign stocks respectively. The regression equation used for estimating is:

\[ \ln V = 2.193 + 0.7241 \ln D \]

where \( V \) is the value of corporate stock (in billion dollars), and \( D \) represents dividends (in 100 million dollars). For estimating foreign stock owned by Canadians it was assumed that 85 per cent of foreign investment income reported on tax returns represented dividend income. All data were taken from Department of National Revenue, Taxation Statistics for various years.
Comparison with Canadian data

In a yet unpublished study Conway analyzed the ownership of 101 widely held Canadian companies with the largest market value of listed shares. These companies, with a total outstanding stock of $28.1 billion, accounted for 80 per cent of the value of all Canadian stock listed on stock exchanges in 1966. Conway estimated that the holdings by Canadian resident individuals in these companies amounted to about $12 billion in 1966. Assuming that these individuals owned 50 per cent of other listed stock in that year, the market value of their holdings of all listed stock amounted to $15.5 billion. This figure has to be blown up to include unlisted stocks in order to derive estimates comparable to those in Table 1. Two alternative estimates of the blow-up factor are readily available: (i) the ratio of all cash dividends to those distributed by widely held companies, and (ii) the ratio of accrued income of all Canadian companies allocable to Canadian resident individual shareholders, to that of widely held companies. Using data for 1967, the first method estimates the blow-up factor at 2.24, and the market value of all stock at 34.7 billion; the corresponding estimates under the second method are 2.81 and $43.6 billion. We thus have a range, from $35 to $44 billion, in which the correct estimate of the market value of domestic stock owned by

---


7 Ibid. Table I-2.

8 Ibid. Ch. II, p. 2.

9 Data for both methods for 1967 are presented in John Bossons, Analysis of the Federal Tax Reform Proposals, in Table 6-4, p. 76 about dividends (method 1), and in Table 6-3, p. 74 about accrued income (method 2).
Canadian individuals should lie. The first method is likely to understate the true market value because some corporations would not have paid dividends in 1966. We, therefore, prefer the second method which uses accrued income, and also provides an estimate of market value, very close to 42.6 billion - the figure reported in Table 1 for 1966.

Rate of Accrual

A study of capital gains in the United States conducted by the author suggests that during the years 1947-64, gains on holdings of corporate stock accrued at an average rate of about 11 per cent per annum.\(^\text{10}\) Because of the considerable interdependence between the Canadian and U.S. capital markets, it is to be expected that the total yield on Canadian and U.S. corporate stocks would be roughly the same. Recent work by Bossons indicates that capital gains accrued at an annual rate of about 8 per cent between 1955 and 1964 in Canada.\(^\text{11}\) Some estimates of gains accruing on corporate stock, using this rate of accrual, are reported in Table 2. Every investor knows that stock prices make for elusive predictions. There is no assurance that during 1972 stock prices would actually appreciate by 8 per cent - the average rate observed during 1955-64 in Canada. In the United States, the average rate of accrual dropped to almost 4 per cent during the years 1965-68, and since then, especially during the past 18 months, stock prices have been subject to severe fluctuations. We present alternative estimates of accrued gains, assuming an annual accrual rate of 5 per cent, in Table 3. In this case,

---


\(^{11}\) The average total return (dividends + accrued gains) in a sample of non-resource companies amounted to 12 per cent during 1955-64. Dividends accounted for about 1/3 of total average return. Cf., John Bossons, Rates of Return on Canadian Common Stock: Dividends, Retentions and Goodwill Gains, Table 9, p. 27.
the projected accrued gains for 1972 amount to $3.2 billion, in contrast with $5.78 billion stated in Table 2. The rest of the tables in this paper incorporate figures reported in Table 2, although the estimates of total accrued gains in Table 3 will be considered at several points.

The official summary of the tax reform bill indicates that share gains realized and accrued (sic!) by individual Canadians in Canadian corporations in 1968 were about $2 billion. Projections for 1972 have been based on this estimate. According to data presented in Analysis of the Federal Tax Reform Proposals, to which a reference was made above, corporate retained earnings allocable to Canadian resident individual shareholders amounted to $1.83 billion in 1967, and $2.1 billion in 1969. The official estimates of accrued gains thus imply that pure goodwill gains were either negative, or very small, in 1968. Our estimates of gains accruing on Canadian corporate shares in 1968 are $3.8 billion (at 8%), or $2.37 billion (at 5%). Both these estimates are higher than those published in the Summary.

Realized gains on Canadian holdings of foreign stock, investment real estate etc., will also be taxed. When accrued gains on these assets are taken into account, the estimates for 1968 amount to $4.5 billion (at 8%), or $2.8 billion (at 5%). The official estimates, therefore, understate actual accrued gains by at least 30 percent. We do not know much about how the estimates in the Summary have been derived, but it seems safe to say that they understate actual accrued gains, perhaps considerably. By the same token, we can conclude that estimates for 1972, and any other projections based on 1968 figures will understate actual accrued gains.

TABLE 2. ACCRUED GAINS ON INDIVIDUALS' HOLDINGS OF CORPORATE STOCK\(a\)

<table>
<thead>
<tr>
<th>Income ($000)</th>
<th>Domestic Stock</th>
<th>Foreign Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average 1966-68</td>
<td>1972</td>
</tr>
<tr>
<td>less than 25</td>
<td>1.90</td>
<td>2.58</td>
</tr>
<tr>
<td>25 - 50</td>
<td>0.84</td>
<td>1.14</td>
</tr>
<tr>
<td>50 - 100</td>
<td>0.51</td>
<td>0.69</td>
</tr>
<tr>
<td>100 and above</td>
<td>0.46</td>
<td>0.63</td>
</tr>
<tr>
<td>Total</td>
<td>3.71</td>
<td>5.04</td>
</tr>
</tbody>
</table>

\(a\)Figures for 1972 are projections based on the average for 1966-68, assuming that the same rate of accrual would continue. Thus, if \(G\) is the average of gains for 1966-68, \(G^{\frac{72}{12}} = G(1.08)^4\)
Here it should be noted that figures reported in Tables 2 and 3 relate only to gains accruing on corporate stock held by resident Canadian individuals. We have not made any estimates of corporate stock held by Canadian corporations, or gains accruing on their holdings. Under the proposed bill, gains realized by corporations will be taxed like individuals' gains—at one-half the applicable marginal rate of tax. Some direct estimates of gains realized by corporations are available; these, along with gains likely to be realized by individuals, shall be presented later in this Section.

### TABLE 3. ACCRUED GAINS ON INDIVIDUALS' HOLDINGS OF CORPORATE STOCK, ASSUMING AN ANNUAL RATE OF ACCRUAL OF 5 PER CENT

<table>
<thead>
<tr>
<th>Income ($ 000)</th>
<th>Domestic Stock Average 1966-68</th>
<th>1972</th>
<th>Foreign Stock Average 1966-68</th>
<th>1972</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 25</td>
<td>1.19</td>
<td>1.44</td>
<td>0.15</td>
<td>0.18</td>
</tr>
<tr>
<td>25 - 50</td>
<td>0.53</td>
<td>0.64</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>50 - 100</td>
<td>0.31</td>
<td>0.38</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>100 and above</td>
<td>0.29</td>
<td>0.35</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Total</td>
<td>2.32</td>
<td>2.81</td>
<td>0.33</td>
<td>0.39</td>
</tr>
</tbody>
</table>

*Figures for 1972 are projections, assuming that gains will continue to accrue at 5 per cent per annum.*

\[ G_{72} = G(1.05)^4. \]
Accrued Gains on Investment Real Estate

The approach used above for estimating value of corporate stock cannot be applied to compute the value of investment real estate. Unlike stock markets, markets for real estate are not very active and mostly local in character; consequently, it is doubtful if the ratio of value to property income calculated from U.S. data would hold for Canada also. Moreover, capital gains on principal residences, which would be exempt from the gains' tax in Canada, are taxed like gains from any other source in the United States. Although liberal roll-over provisions ensure that in effect, most gains on principal residences escape taxation, this does create difficulties in estimating value to property-income ratios correctly, and applying them to Canada. We shall, therefore, use a more indirect approach for estimating capital gains on investment real estate.

In any active capital market, it is to be expected that the rates of return on various forms of investment would be equated, subject, of course, to differences in risk premia, liquidity etc. In the Canadian case, thus, it is reasonable to assume that, on an average, the total return on real estate (rent + capital gains) would not differ much from that on corporate stock (dividends + capital gains). In the United States, the average yield on corporate stock has varied between 12 and 15 per cent. As discussed above, the average yield on corporate stock in Canada has been roughly the same. There are no direct estimates of total return on real estate in the United States, or

---

A regression equation, similar to the one used for corporate stock, was estimated from U.S. data for real estate also. The independent variables included items like interest rate which have not been adequately reported on Canadian income tax returns until the last few years. Furthermore, the dependent variable in the equation was all real estate, not just investment real estate; so, the problem of excluding market value of principal residence would have remained anyhow.
Canada, but given the higher risk involved in stock market investments, the yield on corporate stock will include a higher risk premium. It is expected, therefore, that yield on real estate will be somewhat lower than that on corporate stock. We assume that investors in real estate would earn an average return of about 12 per cent on their investment. We have to turn once again to U.S. data to estimate the rate at which gains have accrued on real estate because no suitable indices of Canadian real estate prices have been compiled. In the United States, accrued gains amounted to about 3.5 per cent of the value of nonfarm real estate in the early sixties. Some indices of U.S. real estate prices, relating to this period, also corroborate this result. Real estate prices have risen more sharply since 1965; therefore, it seems reasonable to assume that accrued gains will amount to about 5 per cent of the value of real estate during the next few years. The total return on real estate consists of rental income and accrued gains. We have estimated the total yield, and the rate of accrual of capital gains on real estate, and we know the rental income reported on Canadian income tax returns. Accrued gains, thus, can be estimated as a function of rental income. For the results reported in Table 3, we have estimated accrued gains at 70 per cent of rental income.

---


15 Let G and R respectively be accrued gains and rent on real estate. If V represents the value of real estate, and Y the total income from it,

\[ Y = G + R. \]

Also,

\[ \frac{G}{V} + \frac{R}{V} = \frac{Y}{V}. \]

We have estimated \( \frac{G}{V} \) at 5 and \( \frac{Y}{V} \) at 12 per cent. Therefore,
TABLE 4. ACCRUED GAINS ON INVESTMENT REAL ESTATE
($ million)

<table>
<thead>
<tr>
<th>Income ($ 000)</th>
<th>Average 1966-68</th>
<th>Projected(^a) 1972</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 25</td>
<td>82.5</td>
<td>100.2</td>
</tr>
<tr>
<td>25 - 50</td>
<td>10.0</td>
<td>12.2</td>
</tr>
<tr>
<td>50 - 100</td>
<td>4.5</td>
<td>5.5</td>
</tr>
<tr>
<td>100 and above</td>
<td>(\frac{1.0}{98.0})</td>
<td>(\frac{1.2}{119.1})</td>
</tr>
</tbody>
</table>

\(^a\)The Projection for 1972 is made by compounding the average gains for 1966-68 at 5 per cent - the annual rate at which gains have been assumed to accrue in recent years.

**Realized Gains**

Tables 2 and 4 have presented an estimate of accrued capital gains which is the maximum amount that can be brought into the tax fold in 1972. But, as we all know, only a portion of these gains would be actually realized, or deemed to be realized in 1972. The decision to realize an accrued gain, which heretofore depended on price expectations and other financial considerations only, will now be affected by the proposed capital gains' tax also. A priori reasoning tells us that individuals will realize some portion of their expected - not necessarily actual - accrued gains during a year. But how expectations are formed, and what proportion of accruals is realized are empirical matters; different individuals will reach different decisions on these points, and economic theory does not offer much help in forecasting them.

\[
\frac{R}{V} = 0.12 - 0.05 = 0.07, \text{ and}
\]

\[
\frac{G}{R} = \frac{G/V}{R/V} = \frac{0.05}{0.07} \approx 0.7
\]
A hypothesis about formation of expectations which is commonly used in econometric research states that although individuals revise their expectations in the light of past mistakes, the future, by and large, is a repetition of the past. Accordingly, expected accrued gains in a given year will be estimated as a weighted average of gains accruing in several past years. This technique can be used only if data on accrued gains for several years are available. Since we do not have such data for Canada at present, we are forced to consider, once again, the experience in the United States where realized gains have been taxed for a long time, and for which accrued gains have also been estimated for several years. The relation between realized and accrued gains for the United States, however, cannot be *ipso facto* applied to Canada because of substantial differences between the U.S. law and the proposed Canadian tax bill on the subject of taxing capital gains. The rate of tax on capital gains will be roughly the same in the two countries, but large amounts of accrued gains escape taxation through gifts and bequests in the United States. 16 Canadian law proposes to tax most accrued gains at the death of an individual. In general, therefore, a higher proportion of accruals will be realized in Canada than in the United States. In Table 5, we report estimates of realized gains, based on U.S. data, but using alternately, the U.S. and the Canadian tax provisions. 17 Tax revenue, likely to be raised by the capital gains tax is also reported in Table 5.

---


17 For deriving the empirical results, the adaptive expectations model described in this Section was modified to specifically consider the effect of deemed realization at death. See footnote 21.
The results presented so far relate to individual taxpayers. Canadian corporations realized about $160 million in gains in 1967, and $190 million in 1969.\textsuperscript{18} It is not clear how much gains Canadian corporations will realize in 1972. The normal growth trend in the economy will suggest an amount in the neighbourhood of $200 million, but the tax on realized gains will provide an incentive to postpone realization of accrued gains. There is no definite way of determining the relative strength of these rival influences. However, since realized gains will be taxed at half the average rate, the tax effect is not likely to be very large. We assume, therefore, that realized gains in the corporate sector will amount to about $200 million; total realizations, thus, will add up to about $796 million in 1972. But all gains realized by corporations in 1972 will not be taxable because gains accruing prior to Valuation Day will be tax-exempt. Assuming that 20 percent of corporate realized gains will be taxable (at an average rate of 23 percent--one-half the nominal rate), the total tax revenue from the capital gains tax will amount to about $140 million, of which $9.4 million will be the tax on capital gains realized by Canadian corporations. If stock market gains accrue at 5 percent a year in 1972, realized gains will amount to $535 million, and the tax revenue to about $83 million.

\textbf{A Comparison}

How do our estimates compare with those made by the Department of Finance (DF)? In the \textit{Summary of 1971 Tax Reform Legislation} net revenue from capital gains in 1972 has been estimated at $130 million--$80 million on individuals' share gains, and $50 million on capital gains of corporations.\textsuperscript{19} The total figure

\textsuperscript{18}From Dominion Bureau of Statistics, \textit{Corporation Statistics}, Ottawa: various years.

\textsuperscript{19}Summary of 1971 Tax Reform Legislation, p. 63, line 5, and p. 64, line 12.
is within the range of our forecast, but that does not confirm or reject the official estimate because, as noted above, there are substantial differences between our estimates of accrued gains and those in the Summary. For a proper comparison between the two sets of estimates we shall require details of methodology and data sources used by DF to estimate individuals' accrued and realized gains, and capital gains of corporations, to make adjustments for deemed realizations of unrealized gains at death, and to calculate marginal tax rates applicable to various income brackets. Although all this information is not readily available, we can make plausible guesses about some of these points and attempt at least a rough comparison between our and DF estimates.

The DF estimate of revenue from corporate capital gains in 1972 is $50 million. To raise this amount in revenue at an average tax rate of 23 percent requires realized taxable gains amounting to about $217 million. Our projection of all gains likely to be realized by Canadian corporations in 1972 is $200 million, and most of these gains would definitely accrue before Valuation Day and thus be exempt from capital gains tax. Taxable realized gains, therefore, are likely to be much smaller than $200 million, and to that extent, the DF estimate of tax revenue is overstated.

Regarding individuals' capital gains, we mentioned earlier that the DF estimates of accrued gains are lower than ours by at least 30 percent, yet the revenue estimate of $80 million is very close to the lower end of the range (83-140 million) derived in this paper. The DF estimates of realized gains have not been published, but it appears that, as in the case of corporate gains, individuals' realized gains in the first year have been overstated. Tax revenue from this source, however, is likely to be much larger than $80 million.

On the whole, therefore, the revenue yield from taxing capital gains in 1972 is likely to be higher than the official estimate. The procedures used
### Table 5. Realized Gains and Likely Tax Revenue, by Income Class, 1972 ($ million)

<table>
<thead>
<tr>
<th>Income Bracket ($ 000)</th>
<th>Total Income in 1969</th>
<th>Total Accrued Gains</th>
<th>Realized Gains on U.S. Pattern</th>
<th>Realized Gains with Deemed Realization at Death</th>
<th>Average Marginal Tax Rate</th>
<th>Tax Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 25</td>
<td>42,011</td>
<td>3,020</td>
<td>124</td>
<td>248</td>
<td>.137</td>
<td>34.0</td>
</tr>
<tr>
<td>25 - 50</td>
<td>1,883</td>
<td>1,310</td>
<td>68</td>
<td>136</td>
<td>.252</td>
<td>34.3</td>
</tr>
<tr>
<td>50 - 100</td>
<td>753</td>
<td>820</td>
<td>47</td>
<td>94</td>
<td>.280</td>
<td>26.3</td>
</tr>
<tr>
<td>100 and above</td>
<td>264</td>
<td>750</td>
<td>59</td>
<td>118</td>
<td>.305</td>
<td>36.0</td>
</tr>
<tr>
<td>Total</td>
<td>44,911</td>
<td>5,900</td>
<td>298</td>
<td>596</td>
<td></td>
<td>130.6</td>
</tr>
</tbody>
</table>

**Sources:**

Col. 1: *1971 Taxation Statistics*, Table 2, p. 12.

Col. 2: Sum of the figures reported in Tables 2 and 4 for each income bracket.

Col. 3: Based on regressions of realized on expected accrued gains using U.S. data. Expected accrued gains were estimated as weighted moving averages of past accrued gains using exponentially declining weights. Obviously, a large number of such averages are possible, we selected the one that gave the best fit in the regression of realized on expected accrued gains.

Col. 4: Col. 3 multiplied by a factor of 2. See footnote 23.

Col. 5: Average taxable income of individuals paying tax in each income bracket in 1969 was first computed. The reported figures are one-half the marginal tax rate applicable to average income using the new rates applicable under the proposed bill.

Col. 6: Col. 4 x Col. 5.
in deriving the DF estimates have not been published; therefore, it is difficult to make a more meaningful comparison, or attempt a reconciliation between the results derived here, and those in the Summary.

IV. Economic Implications

It is clear from results reported so far that capital gains are an important source of income in Canada. The 1972 estimates of accrued gains amount to more than 10 per cent of total income reported on tax returns in 1969 - the last year for which such information is available at present. The figures for individual income brackets are even more revealing: taxable realized gains for 1972 will be about 7 per cent of the income in 1969 of individuals with incomes between $25,000 and 50,000, about 12 per cent for the next higher bracket, and for individuals with income of $100,000 or more, such gains in 1972 will amount to more than 40 per cent of their income from other sources in 1969. The proposed tax will also be a source of substantial additional revenue. As mentioned earlier, in the very first year, it is likely to yield between $73 and $122 million in tax revenue, the latter figure is about 2.3 per cent of the revenue yield from federal taxes on personal income (federal income tax, social development tax, and old age security tax) in 1969.

It must be emphasized that realized gains and revenue figures reported in Table 5 are the initial, or short run effects of the proposed tax change. The ratio of realizations to accruals, as also the tax revenue, will be substantially higher after the new system has been in operation for some time. For example, if the proposed tax had been introduced twenty years ago, 60 per cent of the gains accruing in 1972 would have been realized, i.e., individuals' taxable realized gains would have amounted to $3.54 billion ($1.99 billion if
figures in Table 3 are used), and tax revenue to about $669 million (or 376 million if Table 3 is used). The arithmetic of these computations is quite cumbersome, but some illustrative results, assuming an accrual rate of 5 per cent a year, and a ratio of realizations to accruals of .101 in the first year, are presented in Table 6. In other words, if gains accrue at the rate of 5 per cent per annum, the ratio of realized to accrued gains would change as shown in column 2 of Table 6. It is clear that if the assumptions underlying

\[ R^d_t = b[A_t + U_{t-1}] + e_t \]

\[ U_t = U_{t-1} + A_t - R^d_t, \text{ for } t > 0 \]

\[ = 0, \text{ for } t = 0. \]

\[ R_t = (1 - g) R^d_t + w_t \]

where \( R_t \) = taxable capital gains actually realized in year \( t \) in the United States,

\( R^d_t \) = taxable capital gains which would be realized were a deemed realization at death in effect,

\( A_t \) = total capital gains accrued during year \( t \),

\( U_t \) = the sum of all unrealized accrued gains at the end of year \( t \), excluding gains which have been deferred past death,

\( b \) = the realization rate parameter with deemed realizations at death, assumed to be a constant,

\( g \) = the fraction of realizations which on the average are postponed past death in the absence of a deemed realization provision,

\( e_t, w_t \) = residuals, assumed to be independent random variables,

\( t \) = number of years since a capital gains tax was introduced. In the present case \( t = 1 \) will represent 1973.

This model effectively assumes that the result of not having a deemed realization at death provision is that investors each year indefinitely postpone a fraction of taxable capital gains which they otherwise would have realized in

\[ \text{It assumes that gains accrue at 8 per cent a year, and .101 of gains accruing in the first year are realized in that year. For details of this computation, see the next footnote.} \]

\[ \text{A realization rate parameter was estimated from U.S. aggregate data using the following model:} \]

\[ R^d_t = b[A_t + U_{t-1}] + e_t \]

\[ U_t = U_{t-1} + A_t - R^d_t, \text{ for } t > 0 \]

\[ = 0, \text{ for } t = 0. \]

\[ R_t = (1 - g) R^d_t + w_t \]

where \( R_t \) = taxable capital gains actually realized in year \( t \) in the United States,

\( R^d_t \) = taxable capital gains which would be realized were a deemed realization at death in effect,

\( A_t \) = total capital gains accrued during year \( t \),

\( U_t \) = the sum of all unrealized accrued gains at the end of year \( t \), excluding gains which have been deferred past death,

\( b \) = the realization rate parameter with deemed realizations at death, assumed to be a constant,

\( g \) = the fraction of realizations which on the average are postponed past death in the absence of a deemed realization provision,

\( e_t, w_t \) = residuals, assumed to be independent random variables,

\( t \) = number of years since a capital gains tax was introduced. In the present case \( t = 1 \) will represent 1973.
Table 6 are correct, the ratio of realized to accrued gains will increase almost six-fold in ten years. Although the table does not go beyond 1983, the ratio would reach .673 in 1992, and the long run equilibrium value—corresponding to \( t = \infty \)—will be 0.707. If we change these assumptions slightly, e.g., if we assume that gains accrue at the rate of 8 per cent per annum, the long run ratio of realizations to accruals will be 0.553, and if gains are assumed to increase at the rate of 10 per cent per annum, this ratio will be about 0.6.

**Concluding Observations**

In this paper we have presented estimates of accrued and realized capital gains for various income groups in Canada. We have relied heavily on that year. Unrealized gains so postponed are added to the cost of an asset, and thus escape the capital gains tax. Solving this model to remove \( R^d_t \) and \( U_t \), we have

\[
R_t = (1 - g) b \sum_{k=0}^{t} (1-b)^k A_{t-k} + [e_t + w_t]
\]

which is a straightforward distributed lag. This model was fitted to U.S. aggregate data for 1947 to 1964, and resulted in estimates of \( b = .1 \) and \( g = .5 \); hence, \( R^d_t \) will be roughly twice \( R_t \). The estimate of \( b \) was modified to reflect the different distribution of gains over income classes in Canada. These modifications were based on data on realizations and accruals of capital gains by households in different income classes reported in Bhatia, "Capital Gains and the Distribution of Income," Table 9.

To extrapolate the ratio of realized to accrued gains, we have to consider the rate of growth of accrued gains also. It can be shown that

\[
\frac{R^d_t}{A_t} = b \left[ 1 + \frac{\alpha}{1-\alpha} (1 - \alpha^t) \right], \quad \alpha = \frac{1-b}{1+r}
\]

where \( r \) is the average rate of growth of accrued gains and \( b \) and \( t \) are defined above. Assuming \( r = .05 \) and \( b = .1 \), \( \alpha = \frac{1-.1}{1+.05} = .86 \). Thus

\[
(R^d/A)_0 = b = .1 \\
(R^d/A)_1 = (1+\alpha)b = .186 \\
(R^d/A)_2 = (1+\alpha+\alpha^2)b = .259 \\
(R/A)_\infty = \frac{b}{1-\alpha}, \text{ provided } \alpha < 1
\]

For further discussion of this model, see Bossons, "An Economic Overview of the Tax Reform Legislation," paper presented to the 23rd Tax Conference of the Canadian Tax Foundation, Vancouver, November, 1971.
TABLE 6. PROJECTED ACCRUED GAINS, REALIZED GAINS, AND TAX REVENUE, 1972-83a
(dollar figures in millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio of Realized to Accrued Gains</th>
<th>Accrued Gains</th>
<th>Realized Taxable Gains</th>
<th>Revenue Yield</th>
<th>Revenue Yield From Deemed Realization</th>
<th>Revenue From Estate Tax</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>0.101</td>
<td>5,900</td>
<td>596</td>
<td>131</td>
<td>65</td>
<td>227</td>
<td>-162</td>
</tr>
<tr>
<td>1973</td>
<td>0.186</td>
<td>6,195</td>
<td>1,152</td>
<td>252</td>
<td>126</td>
<td>238</td>
<td>-112</td>
</tr>
<tr>
<td>1974</td>
<td>0.259</td>
<td>6,505</td>
<td>1,685</td>
<td>369</td>
<td>184</td>
<td>250</td>
<td>-65</td>
</tr>
<tr>
<td>1975</td>
<td>0.322</td>
<td>6,830</td>
<td>2,190</td>
<td>480</td>
<td>240</td>
<td>263</td>
<td>-23</td>
</tr>
<tr>
<td>1976</td>
<td>0.376</td>
<td>7,172</td>
<td>2,697</td>
<td>591</td>
<td>295</td>
<td>276</td>
<td>19</td>
</tr>
<tr>
<td>1977</td>
<td>0.422</td>
<td>7,530</td>
<td>3,178</td>
<td>696</td>
<td>348</td>
<td>290</td>
<td>58</td>
</tr>
<tr>
<td>1978</td>
<td>0.462</td>
<td>7,906</td>
<td>3,653</td>
<td>800</td>
<td>400</td>
<td>304</td>
<td>96</td>
</tr>
<tr>
<td>1979</td>
<td>0.496</td>
<td>8,302</td>
<td>4,118</td>
<td>902</td>
<td>451</td>
<td>319</td>
<td>132</td>
</tr>
<tr>
<td>1980</td>
<td>0.525</td>
<td>8,717</td>
<td>4,576</td>
<td>1,002</td>
<td>501</td>
<td>335</td>
<td>165</td>
</tr>
<tr>
<td>1981</td>
<td>0.550</td>
<td>9,152</td>
<td>5,084</td>
<td>1,114</td>
<td>557</td>
<td>352</td>
<td>205</td>
</tr>
<tr>
<td>1982</td>
<td>0.571</td>
<td>9,610</td>
<td>5,487</td>
<td>1,202</td>
<td>604</td>
<td>370</td>
<td>231</td>
</tr>
<tr>
<td>1983</td>
<td>0.590</td>
<td>10,091</td>
<td>5,954</td>
<td>1,305</td>
<td>652</td>
<td>388</td>
<td>264</td>
</tr>
</tbody>
</table>

aBased on the assumption that gains accrue at an average rate of 5 per cent after 1973. The figures for 1972 are from Table 5.

Col. 2: See footnote 21.

Col. 3: 1972, from Table 5; other years: derived by compounding the 1972 figure at 5 per cent.

Col. 4: Col. 3 x Col. 2.

Col. 5: Col. 4 x 0.189 - the average rate of tax calculated from Table 5.

Col. 6: 0.5 x Col. 5.

Col. 7: The amount for 1969, compounded at 5 per cent per annum. The 1969 figure is from Taxation Statistics, 1971.

Col. 8: Col. 6 - Col. 7.
U.S. data although evidence from Canadian sources, wherever available, was duly considered. The results suggest that capital gains are an important source of income in Canada, and the proposed tax will yield substantial amounts of revenue in years to come. But the capital gains tax cannot be viewed in isolation from other aspects of the proposed tax changes. One obvious topic, which we have not examined in any detail, is the proposed alteration of the estate tax, which, besides causing other economic effects, would affect the yield from the capital gains tax because of deemed realization of accrued gains at death. Consequently, the revenue figures, especially the projections contained in Table 6, should be treated as highly tentative. In this context it should be noted that the main contributions of this paper are the methodology of estimating income distribution of wealth, and perhaps the first systematic estimates of accrued gains and their income distribution in Canada. All forecasts and projections, regardless of the techniques used, are only as good as the assumptions underlying them. Clairvoyance is not the economist's forte!

In this context, it is inevitable to ask if the Canadian experience will differ much from the experience in the United States, where a capital gains tax has been levied for a long time. The proposed legislation in Canada is better than the U.S. law inasmuch as there is no distinction between short and long-term gains, and there will be deemed realization at death. The tax provisions in the two countries, however, are alike in taxing capital gains at preferential rates. Over the years, the tax base in the United States has been eroded by a steady stream of exemptions, allowances and special treatments, resulting in substantial reduction in the effective progressiveness of the personal income tax. A major culprit in this regard is the preferential
treatment of capital gains. It is stated that "the (Canadian) system makes
capital gains part of the progressive rate system for individuals, taxing
gains in the same manner as other income, according to ability to pay."
(The Summary of 1971 Tax Reform Legislation, p. 30). The proposed taxation
of capital gains is better than no tax on them, but one wonders if these
provisions would not eventually become a significant loophole in the tax
system, especially for the upper income groups.